



BHARAT HEAVY ELECTRICALS LIMITED
PROJECT ENGINEERING MANAGEMENT, NOIDA

Date-30-Dec-20

CORRIGENDUM- 01

PROJECT	:	4 X 225 MW Arun-3 HEP, Nepal
PACKAGE	:	HVAC for Hydro
ENQUIRY NO	:	PE/PG/ARN/E-6566/2020 Dated 09.12.2020
SUBJECT	:	PRE-BID CLARIFICATION + DUE DATE EXTENSION

Type of Corrigendum			
Technical Corrigendum -	☒	Commercial Corrigendum -	☒

In reference to the above mentioned tender enquiry for **D/G EOT CRANES UP TO 100T** package

Please note the following changes

1. Due date has extended from 30-Dec-20 to 15-Jan-21 @ 02:00 PM. Bid opening shall be done at 04:00 PM on the due date.
2. Replies to Pre-bid queries + Technical Amendment-01 attached

All the other terms and conditions of the tender enquiry remain unchanged. All the bidders are requested to quote accordingly.

Yours faithfully,

For and on behalf of BHEL

Upendra Chaudhary
Manager/BOP

Arun-3-Hydro Electric Project-Nepal(4X225 MW) - PRE BID CLARIFICATION SCHEDULE		Specification No : PE-TS-437-571-11000-A-A001(Rev 00)		
		Section I		
		Rev No 00		Date : 24.12.20
Total no of sheets :1				
PRE BID CLARIFICATION SCHEDULE- HVAC System for Hydro				
SI No	Section/ Clause/ Page No	Staement of the referred Clause	Clarification Required	BHEL Reply
1	Page 49 of 470	Standard Electrical scope between BHEL and Vendor, Package : Electric Hoist for AC Ventilation	The contents of the page are not fully displayed. Hence provided a fresh page	Refer Amendment no. 1
2	Vol-II B Sec D -Page 417 of 470	Insulation Data Sheet	Please confirm the finish of insulation for the Ducts in Air conditioning system(Item SI No B-7 of Annexure I of unpriced BOQ)	Finish of insulation shall be as per clause 25.5.9 of chapter 25 (page 67-68 of 470) under sub section C2-A and other relevent clauses of technical specifications.
3	Unpriced BOQ-Item No.C- 10.1.d of Annexure-I	Butterfly Valve Chamber Switchboard- Incomer- 400A	Kindly confirm the loads other than the Supply/ Exhaust Fans of Butterfly valve chamber, Ventilation equipment for the DG Room, Battery Room and Battery charger room at PPV Portal(ADIT 4 Portal) connected to the Butterfly chamber HVAC panel as the incomer rating of 400 Amps appears to be much on the high side.	Rating of Butterfly Valve Switchboard shall be as per BOQ and specification.
4	Page 467 of 470 of Technical specification	HT Room Layout at Switchyard-Plan at 562.5 ML	Kindly relate the relevance of this drawing as we are unable to locate this area neither in the specification, nor in the detailed power plant layouts (Power House/ Transformer Hall layouts)	Refer Amendment no. 1
5	Page 466 of 470 of Technical specification	Layout of Mechanical Workshop in switchyard	Kindly relate the relevance of this drawing as we are unable to locate this area neither in the specification, nor in the detailed power plant layouts (Power House/ Transformer Hall layouts)	Refer Amendment no. 1
6	Unpriced BOQ -Item noA- 7 Of Annexure-I	Cabinet type Centrifugal Fans	Kindly provide Constructional details of the Housing of Cabinet type centrifugal Fans	Refer Amendment no. 1
7	Unpriced BOQ-Item NoC- 10.8	Screened (Instrumentation) control Cables	Electrical Scope Matrix(Annexure-I to Section C-Standard Electrical scope between BHEL and Vendor)-Page 167 Of 470 Item SI No 15. states the scope of vendor as only providing the input cable schedule (C&I) wheareas the BOQ indicates the scope as provision of Screened instrumenatation control cables. Kindly clarify the scope of HVAC Vendor in C& I Cabling.	Scope shall be as per electrical scope matrix and BOQ , as per specifications.
8	General	C&I scope	NO C& I Panel (such as PLC/GUI/ Microprocessor based) is included in HVAC Vendors Scope. Please confirm	Control shall be provided as per specification requirement. Also, Kindly refer point No. 18 & 19 of specific technical requirement under sub- section C4 (page no 301 of 470) for better clarity.
9	General	C&I	Request you to provide indicative P& I Diagram with the scope demarcation.	Scope is clear. Bidder to follow specifications

	HVAC FOR HYDRO 4X225 MW ARUN-3 HEP	SPECIFICATION NO. PE-TS-437-571- 11000-A-A001
		AMMENDMENT-1
		DATE: 24/12/20
		SHEET 1 OF1

AMENDMENT TO EXISTING CLAUSES OF TECHNICAL SPECIFICATION

Sl. No.	Clause	Existing description	To be read as (Amendment)
1	Section -I, Sub- section C2-A , clause 25.5.1, Page no 66 of 470 of Technical specifications	The galvanized steel sheet ducting shall be fabricated at site with latest mechanized method form various sections of the duct.	The galvanized steel sheet and MS ducting shall be factory fabricated with latest mechanized method form various sections of the duct. However some portion of ducting can be site fabricated as per suit to site /customer requirement and same shall be decided during execution/ detailed engineering stage.
2	Section-I, Sub-section C1 ,Page 49 of 470 of Technical specifications	Standard Electrical scope between BHEL and Vendor, Package : Electric Hoist for AC Ventilation)	Legible copy of Standard Electrical Scope between BHEL and Vendor for Electric hoist for HVAC system is attached.
3	Section-II, Sub-section-6, Page 467 of 470 of Technical specifications	HT Room Layout	HT room is a standalone room at switchyard area. For this room only Wall mounted Axial fans along with local starter panel, termination kit/ cable lugs & glands at fan end, all other accessories for installation of fan, Intake Louver/Back draft Dampers shall be in bidder scope. For all other details bidder to follow technical specifications.
4	Section-II, Sub-section-6, Page 466 of 470 of Technical specifications	Layout of Mechanical Workshop near switchyard area	Mechanical workshop is standalone room located adjacent to Switchyard area. Switchyard area layout drawing showing location of Mechanical Workshop and Electrical scheme indicating location of source of Power supply for HVAC equipment for Mechanical workshop is attached.
5	Unpriced BOQ -Item No.A- 7 Of Annexure-I	Cabinet type Centrifugal Fans	Housing of Cabinet type centrifugal fans shall be as per manufacturer standard subject to approval of end user during detailed engineering. For all other details bidder to follow technical specifications.

STANDARD ELECTRICAL SCOPE BETWEEN BHEL AND VENDOR

PACKAGE: ELECTRIC HOIST FOR HVAC SYSTEM

PROJECT 4X225 MW ARUN-3 HEP

SCOPE OF VENDOR: SUPPLY & SUPERVISION OF ERECTION & COMMISSIONING OF VENDOR'S EQUIPMENT

<u>S. NO</u>	<u>DETAILS</u>	<u>SCOPE</u>	<u>REMARKS</u>
1	Isolating Switch	Vendor	
2	Power cables, control cables, screened control cables and any special cables (if required) between equipment supplied by vendor.	Vendor	
3	Cabling material (cable trays, accessories, cable tray supporting system, conduits etc).	Vendor	
4	Equipment Earthing	Vendor	All equipment metallic enclosures / frames, metal structure etc. shall be grounded at two points each to the nearest grounding points / risers provided by BHEL.
5	Motors	Vendor	
6	Cable glands and lugs for equipment supplied by vendor	Vendor	1. Double compression Ni-Cr plated brass cable glands 2. Solder less crimping type heavy duty tinned copper lugs for power & control cables.
7	a) Input cable schedules (C & I) b) Cable interconnection details for above c) Cable block diagram	Vendor Vendor Vendor	Cable listing for Control and Instrumentation Cable in enclosed excel format shall be submitted by vendor during detailed engineering stage.
8	Equipment layout drawings	Vendor	
9	Electrical Equipment GA drawing	Vendor	For necessary interface review.

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

DRG. NO. TB-3-405-316-001

6

5

4

3

2

1

F

E

D

C

B

A

F

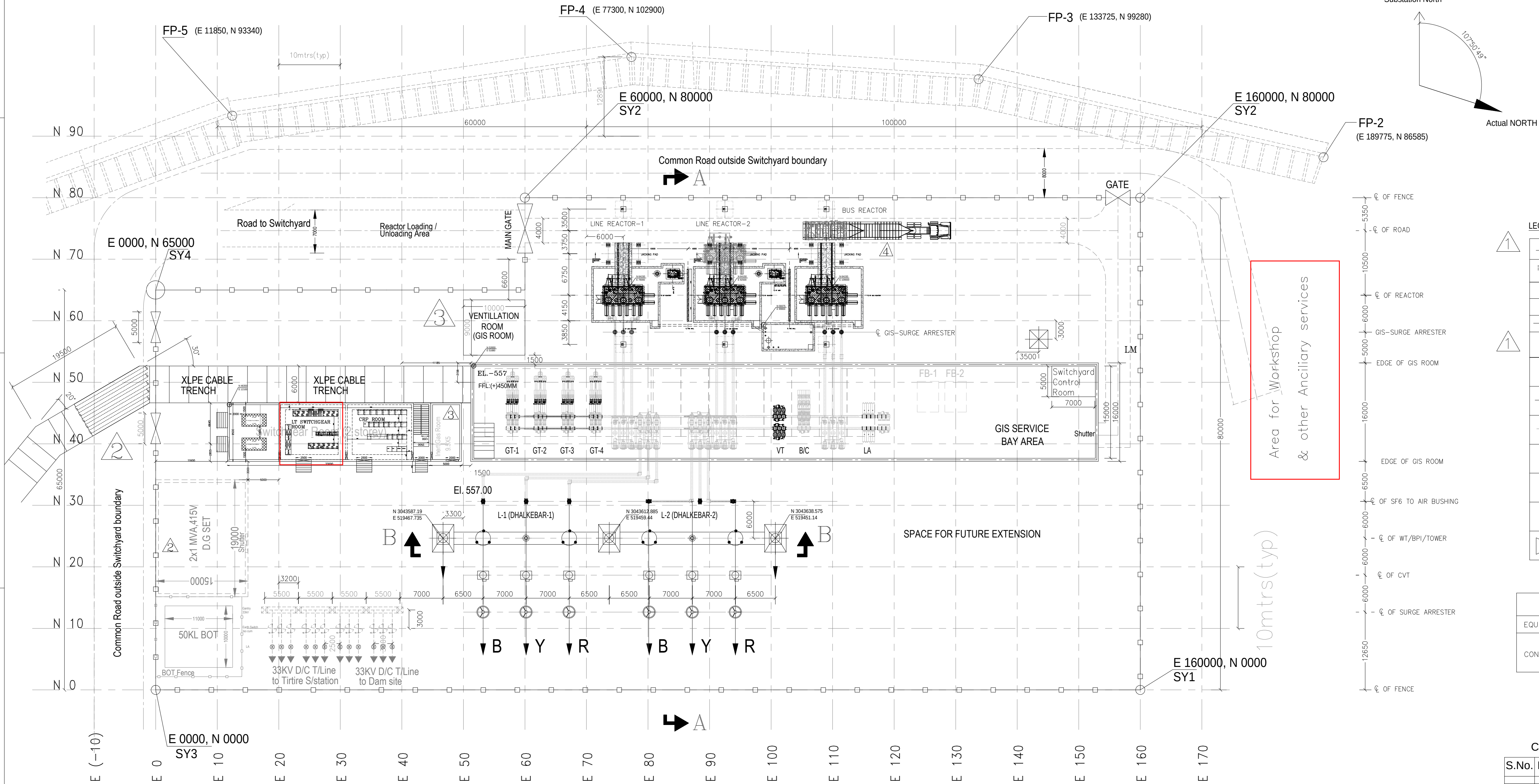
E

D

C

B

A



MINIMUM CLEARANCE TABLE		400KV
PHASE TO PHASE (PP) (mm)		4000
PHASE TO EARTH (PE) (mm)		3500
SECTION CLEARANCE (SC) (mm)		6500
HEIGHT OF CONDUCTOR CENTRE LINE OF FIRST LEVEL (MIN.) MM. (FROM PLINTH LEVEL)		8000
GROUND CLEARANCE TO NEAREST PART NOT AT EARTH POTENTIAL OF AN INSULATOR SUPPORTING LIVE CONDUCTOR		2550
CREEPAGE DISTANCE (mm/kV)		25

LEGEND TABLE:-

	400KV TENSION INSULATOR NOT IN BHEL'S SCOPE
	QUAD MOOSE ACSR CONDUCTOR
	TWIN MOOSE ACSR
	SHIELD WIRE
	FENCE (NOT IN SCOPE OF BHEL)
	CONNECTION TO QUAD ACSR MOOSE CONDUCTOR
	PROPOSED SCOPE
	EXISTING/FUTURE SCOPE (NOT IN TBG SCOPE)
	GIB (GAS INSULATED BUS DUCT)
	TOWER WITH PEAK
	LM (LIGHTNING MAST)
	ENTRY GATE (NOT IN BHEL SCOPE)

CONDUCTOR SIZE DETAILS

EQUIPMENT INTERCONNECTION	400 KV	QUAD 'MOOSE' CONDUCTOR
CONNECTION DROPS	400 KV	QUAD 'MOOSE' CONDUCTOR ON CVT AND SURGE ARRESTER

CO-ORDINATES & ELEVATIONS OF IMPORTANT POINTS

S.No.	DESCRIPTION	POINTS	EASTINGS	NORTHINGS	ELEVATION
1.	SWITCH YARD	SY1	519427.546	3043730.041	557.00
		SY2	519332.186	3043683.753	557.00
		SY3	519517.939	3043543.820	557.00
		SY4	519422.580	3043497.532	557.00
2.	FLOOD PROTECTION WALL	FP2	519364.876	3043704.311	557.00
		FP3	519369.970	3043647.066	557.00
		FP4	519383.822	3043592.261	557.00
		FP5	519412.797	3043533.433	557.00

The coordinates shown above are as per Drg No: PH-AR3-C001

SYSTEM PARAMETERS

NOTES:-

- RATED VOLTAGE : 400kV
- HIGHEST SYSTEM VOLTAGE : 420kV
- SYSTEM VOLTAGE VARIATION : -5% to +5%
- RATED FREQUENCY : 50 Hz, ±3%
- INSULATION LEVELS FOR 400KV CIRCUIT BREAKERS AND DISCONNECTING SWITCHES
- 5A. RATED ONE MINUTE POWER FREQUENCY : 650 KV RMS (GIS) WITHSTAND VOLTAGE BETWEEN LIVE TERMINAL AND EARTH: 630 KV RMS FOR POTHEAD YARD EQUIPMENTS
- 5B. RATED LIGHTNING IMPULSE WITHSTAND VOLTAGE : A) ± 1425 KVP BETWEEN LIVE TERMINALS AND EARTH. B) ± 1665 KVP IMPULSE ON ONE TERMINAL AND OTHER TERMINAL EARTHED (ACROSS INSULATING DISTANCE).
- 5C. RATED SWITCHING IMPULSE WITHSTAND VOLTAGE : 1050 KVP (PHASE TO EARTH) 1425 KVP (PHASE TO PHASE)
6. RATED SHORT TIME WITHSTAND CURRENT CAPACITY : 50 KA/SEC. RMS
7. SYSTEM NEUTRAL EARTHING : EFFECTIVELY EARTHED
8. AC AUX. SUPPLY : 415V, 3PH, 4 WIRE (+10% TO -10%) 240V, 1PH, 2 WIRE (+10% TO -10%) 220V DC, 2 WIRE, +10% TO -20%
9. CONTROL VOLTAGE : 220V DC, 2 WIRE, +10% TO -20%
11. GIS BUS CONFIGURATION : DOUBLE BUSBAR, 400 kV, 2500A, 50KA FOR 1S
12. ALL EQUIPMENT SHALL BE RATED FOR 50 DEG CENTIGRADE AMBIENT AND OUTDOOR INSTALLATION.

BILL OF QUANTITY OUTDOOR EQUIPMENT:-

S.NO.	DESCRIPTION	SYMBOL	QUANTITY (NOS.)
1	420 kV INDOOR GIS		01
2	420 KV, 1-ph SF6 TO AIR BUSHING		06
3	420kV, 1-ph CVT		06
4	336kV, 1-ph SURGE ARRESTER		06
5	420kV, 8 KN, 1-ph, BUS POST INSULATOR		02
6	WAVE TRAP		04
7	400KV,80MVAR REACTOR (BHEL MAKE)		03
8	NGR (BHEL MAKE)		02
9	120kV, 1-ph SURGE ARRESTER FOR NGR		2

ADDITIONAL INFORMATION :
WO NO. :

STATUS OF DRAWING :

DISTRIBUTION OF PRINTS :

PROJECT: ARUN-3 HYDRO ELECTRIC PROJECT (NEPAL)
(4 x 225 MW)

CUSTOMER: SJVN ARUN-3 POWER DEVELOPMENT
COMPANY PVT. LTD. (SAPDC LTD.)

CONSULTANT: SJVN LTD.
(A JOINT VENTURE OF GOVT OF INDIA AND GOVT OF HP)

DR. NAME SIGN. DATE
DRN. PK 30/10/2018
CHD. Vyom/VK 30/10/2018
APPD. SKS 12/09/2018

DEPT. TBG CODE SCALE NTS CARD CODE

TITLE ELECTRICAL LAYOUT PLAN AND SECTION
OF 4x225MW OF ARUN-3 HEP

DRG.NO. TB-3-405-316-001
SHT. No 01 NO. OF SHT. 04

REV. 04

SIZE-A2

DRAWING NO.

CUSTOMER'S DRAWING NO.

A

A

B

B

C

C

D

D

E

E

F

1

2

3

4

5

6

SHEET	01	
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REV	00
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SIZE-A2

1-2

-1

Fold-2

Fold-1

Fold-3

Fold-3

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LT SWITCHGEAR LOCATED INSIDE SWITCHYARD AREA (BETWEEN GRIDS N40–N50 & E20–E30) – BHEL SCOPE

CABLES (BIDDER'S SCOPE)

HVAC EQUIPMENT INSIDE MECHANICAL WORKSHOP

Notes:

1. This scheme is for indicating the tentative location of Power Supply source.
2. Scope of supply shall be as per Electrical scope matrix and specifications.

THIS SCHEME IS INDICATIVE AND FOR TENDER PURPOSE ONLY.

JOB No.		437		4x225 MW ARUN-3 HEP																		
STATUS CONTRACT																						
DISTRIBUTION																						
TD												BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA	DEPT CODE A		NAME	SIGN	DATE					
No.OFF											DRN			MS		24.12.2020						
REV	DATE	ALTD	CHD	APPD							DESN			MS		24.12.2020						
											CHD			VK		24.12.2020						
											APPD			GB		24.12.2020						
TITLE ELECTRICAL SCHEME FOR HVAC FOR MECHANICAL WORKSHOP												MPL	C	MSE	I	MAX	E	DEPT.	SCALE: NTS	DRAWING No.		
																			SIGN			
																			DATE		SHEET 01	OF 01